Teaching good writing, why bother?
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My university is now engaged in a Quality Enhancement Plan entitled "Write to the Top," designed to infuse writing throughout the curriculum. When this plan was still under consideration, a colleague opined, "Why should I bother teaching writing, English [faculty] can do it better." It's a fair question. Why should we, as teachers of science, teach writing?

For the vast majority of us, the currency of thought is words. When we are struggling to understand complex material, most of us write. To think about the exquisitely complex interactions involved in biological pathways or to infer the crystallization conditions of magma leading to a specific mineral's composition and crystal structure requires the precise use of words.

Learning theorists tell us that writing and thinking are inextricably linked. We cannot write without first thinking, and writing well requires that we first think well. As most of us have discovered when writing for publication, the writing process helps clarify our thinking. Why only when writing for publication? Truthfully, any kind of writing can clarify thinking, but we usually spend more time and care when we intend to publish. This greater care in our writing results in greater clarity in our thinking and increased depth of understanding.

Why should we teach our students to write well? Teaching them to write well gives students a powerful thinking and learning tool. Expecting good writing in well-designed, writing-based assignments leads to critical thinking and deeper understanding (Moore 1993).

In science, our theories or laboratory data may be presented in figures, numbers, or equations, but interpretation is done with language. Language is a sometimes coarse tool. To correctly represent the nuances of our results requires great precision in the language used to communicate them to others. In any scientific profession, clear communication skills will let your thoughts stand out and be considered while those of poor communicators will likely be jumbled and possibly dismissed. We owe it to the professionals our students will become to teach them good oral and written communication skills.

There are numerous pedagogical applications for writing in science classrooms. Properly constructed writing assignments can help students connect with the discipline (Stout 2010) and increase their motivation and learning (Hulleman and Harackiewicz 2009). Well-designed writing assignments can both engender deeper understanding and assess the depth of students' understanding (Stout 1997, forthcoming). All of these assignments can be strengthened by using peer-evaluation, which often benefits the peer-evaluators more than those who receive the evaluation (Trautmann 2009).

Another reason to emphasize communication skills is to better equip our students to be effective spokespersons for science. The public perception of science has been eroding for some time and has declined markedly since the leaking of stolen e-mail messages regarding climate change in November 2009. The reasons for this are many, but one is instructive of the problem we have in describing our science to the public. We use the word uncertainty far differently than the general public. To us it is a statistical measure of precision. To the public, uncertainty implies that we are unconvinced of the information we are presenting.

The 2010 annual meeting of the American Association for the Advancement of Science was themed "Bridging Science and Society" (Lempinen 2010). It included a workshop on science communication. We all need to more effectively communicate with the public. We need to equip our students to do the same.

Antonine Lavoisier is quoted as saying, "It is impossible to dissociate language from science or science from language.... To call forth a concept a word is needed" (Moore 1992, p. 3). It actually goes deeper than Lavoisier realized. To either call forth or communicate a complex concept requires many words carefully woven together to form sentences and paragraphs. The careful weaving of words through clear, concise speaking and writing is required to master or to communicate science. To teach good science then requires that we both use good language skills and expect our students to as well. We must convince our students that good writing skills are necessary to express the complexities of science, and sometimes we must teach them those writing skills.

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